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Medical Imaging meets Deep Learning

Michael Bronstein

Università della Svizzera Italiana, Switzerland

Geometric deep learning on graphs and manifolds

In the past decade, deep learning methods have achieved unprecedented performance on a broad range of problems in various fields from computer vision to speech recognition. So far research has mainly focused on developing deep learning methods for Euclidean-structured data. However, many important applications have to deal with non-Euclidean structured data, such as graphs and manifolds. Such data are becoming increasingly important in a broad spectrum of fields ranging from computer graphics and 3D vision to high energy physics, and in particular, in biological sciences such as medical imaging and drug design. The adoption of deep learning in these fields has been lagging behind until recently, primarily since the non-Euclidean nature of objects dealt with makes the very definition of basic operations used in deep networks rather elusive. In this talk, I will introduce the emerging field of geometric deep learning on graphs and manifolds, overview existing solutions and applications, and outline the key difficulties and future research directions.